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PLANTAE MEXICANAE IX

BY

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AECHMEA MAGDALENAE AND ITS UTILIZATION AS A FIBRE PLANT

Aechmea magdalenae (*André*) *André ex Baker*, a fibre plant of southeastern Mexico, Central America and northwestern South America, is the basis of one of the most important native industries of the Chinantec and Zapotec Indians of Oaxaca. Since this industry is very ancient, yet relatively little known, the following notes on the plant and its utilization may be of interest to anthropologists and to those economic botanists who are engaged in fibre investigations.

Aechmea magdalenae is known throughout its range by the vernacular names *pita* and *pitafloja*. These are inclusive terms for many fibre plants of the Amaryllidaceae and Bromeliaceae, but in this paper they are restricted to *Aechmea magdalenae*.

Aechmea magdalenae *(André) André ex Baker* Handb. Bromel. (1889) 65.

Chevalliera Magdalenae André Enum. Bromel. (Dec. 13, 1888) 3; in Rev. Hort. 60 (Dec. 16, 1888) 563.

Bromelia Magdalenae (André) C. H. Wright in Kew Bull. 1923 (1923) 267.

Ananas magdalenae (André) Standley in Standley & Calderón Lista Prel. Pl. Salvador (1925) 45.

VERNACULAR NAMES IN OAXACA:

Chinantec: *guh-to-oh*
Spanish: *clavel; ishte; iste; ixtle; pita; pitafloja; vitaya*
Zapotec: *la-ga-ge-chi; ye-tsi-ro-tee*

Aechmea magdalenae occurs in forested areas in southeastern Mexico, Guatemala, Honduras, Salvador, Costa Rica, Panama, Colombia and Ecuador. The type was collected in Colombia.

This large terrestrial species resembles the pineapple in many respects, and consists of a rosette of leaves and a stalked inflorescence. The leaves which are frequently six feet long (they have been reported as long as ten feet) are narrow, linear, very flexible and armed along the margins with prominent, recurved teeth. The red inflorescences are large and capitate; the fruits are enlarged and juicy. The plants tend to form extensive and impenetrable thickets on the forest floor. These thickets are so characteristic an ecological formation in some parts of Central America that they have been called *pitales* from the vernacular name of the plant. In the Districts of Villa Alta and Choapam—the Chinantla of Oaxaca—the northeastern limits of its range, *Aechmea magdalenae* is very abundant at altitudes of between 450 and 650 meters.

Aechmea magdalenae is the basis of the pita industry of the Chinantec Indians of the Chinantla. The extraction of the fibre was practised by the Chinantecs even in pre-hispanic times. The *Relación de Chinantla*[1], which was written in Chinantla in 1579, and which has recently been translated (Bevan, B. "The Chinantec: Report on the central and southeastern Chinantec region. Vol. 1—The Chinantec and their habitat" in Inst. Panam. Geogr.

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[1] D'Esquibel, Diego "Relación de Chinantla" 1579; published in Pap. Nueva España 4 (1905).

Hist. Publ. 24 (1938) 135-144), states that the inhabitants "make a fibre like hemp".

The pita industry is believed to have been much more extensive in former times than it is now. Bevan further states: "It appears that formerly this cutting and dressing of pita formed quite an important industry in certain parts of the Chinantla, and that far away in Oaxaca, the pita-fibre of this region was greatly esteemed for its superior qualities."

At the present time, the industry is centered in San Pedro Tepinapa (long. 96°00′, lat. 17°29′) and to a lesser extent in Monte Negro de Lalana (long. 95°45′, lat. 17° 25′) and Río Chiquito (long. 95°53′, lat. 17°41′). Very little pita work is carried on in San Juan Teotalcingo, San Juan Petlapa and San Juan Toabela—the seats of the Chinantec basketry industry. This is due to the fact that *Aechmea magdalenae* is not abundant at the altitude of these towns and only scattered plants are to be found in the surrounding forests.

The work of procuring the fibre is accomplished chiefly by the Chinantec women who cut the leaves near the ground and remove the soft, flexible but strong fibres. The extraction process consists in rubbing the softer tissues of the leaf free from the fibres on a metate. The fibres are then thoroughly washed and freed from extraneous materials. When dry, the finished product is almost pure white in color.

Very little of the fibre is worked by the Chinantecs themselves. In San Juan Teotalcingo and neighboring villages, a small amount of the pita fibre is utilized in the manufacture of the pheasant- and falcon-feather fans so typical of the region, but, other than this, no use is made of the fibre locally by the Chinantecs not even in the manufacture of their baskets.

The greater part of the fibre which the Chinantecs gather and prepare is sold to Zapotec carriers who take it to such large Zapotec centers as San Ildefonso Villa Alta, Yalalag, and Oaxaca City. In these centers the fibre is worked into hammocks, ropes, nets and many other articles. Some of the Chinantec pita fibre finds its way to Vera Cruz through the village of Monte Negro de Lalana and by way of the Río Monte Negro. In the Collection of Economic Plants of the Botanical Museum of Harvard University there is a large hank of fibre of *Aechmea magdalenae* which was purchased in San Ildefonso Villa Alta and which, according to the natives, had been traded in from the mountain village of San Pedro Tepinapa. In the Economic Herbarium of Oakes Ames there is a sheet (No. 8322) of this plant from the same region.

Pita fibre is also extensively used by the Zapotec Indians of the Isthmus of Tehuantepec, the southeasternmost part of Oaxaca, immediately adjacent to the Chinantla. On the Isthmus, *Aechmea magdalenae* is often referred to as *ixtle* (Llewelyn Williams "Arboles y arbustos del Istmo de Tehuantepec" in Lilloa 4 (1939) 162). This term, in its usual and general sense, is applied to desert species of fibre-plants which, because of the dense covering of wet tropical forest, do not occur on the Isthmus.

An early and detailed account of the industry is that given by J. J. Williams in J. G. Barnard "The Isthmus of Tehuantepec" published in 1852. Barnard's work, which includes a very complete account of the vegetable products of Tehuantepec, has unfortunately in the past been neglected or overlooked. Due to this fact, Williams' discussion of pita (p. 184-5) will be quoted in part:

"Among the spontaneous products is the *bromelia pita,* or ixtle of the Isthmus . . . . Of this prolific plant there are numerous varieties, all yielding fibres which vary in quality from the coarsest hemp to the finest flax . . . . The simplicity of its cultivation and the facility of extracting and preparing its products render it of universal use. From it is fabricated thread and cordage, mats, bagging and clothing, and the hammocks in which the natives are born, repose and die. The fibres of the pita are sometimes employed in the manufacture of paper, it is used as a caustic for wounds, and its thorns serve the Indians for needles and pins. The point generally selected for its cultivation is a thick forest, from which the small undergrowth is removed by cutting and burning. The roots of the old plants are then set out, at a distance of five or six feet apart, and at the end of a year the leaves are cut and 'rasped'. When the pita is young its fibres are fine and white, but as it increases in age they become longer and coarser . . . . In a wild state the thorns are very numerous, but by cultivation they are diminished both in size and number, and in many instances there are none at all. Even with the imperfect instruments used in cleaning the leaves, four or five pounds of fibres per day is only a fair average for the labor of a man. . . . In 1831, . . . the ixtle plantations in the northern division numbered 1221."

Aechmea magdalenae is known to be utilized as the source of a fibre not only by the natives in Mexico, but also in Honduras (Standley in Field Mus. Nat. Hist. Publ. Bot. 10 (1931) 126), Costa Rica (Standley in ibid 18 (1937) 148), Panama and other parts of Central America (Standley, in Contrib. U. S. Nat. Herb. 27 (1928) 108), and Colombia (Wright in Kew Bull. 1923 (1923) 266-7; Archer in Scientific Monthly 44 (1937) 14).

Although it must be classed as one of the most desirable of Mexican fibre plants, *Aechmea magdalenae* has apparently only recently begun to attract the attention which it merits. It was not mentioned in Altamirano's inclusive list of the fibres of Mexico (Altamirano, F. ''Datos acerca de las plantas fibrosas de Mexico'' in Anal. Inst. Med. Nac. 11 (1910) 9-54), nor is it included in the most recent treatment of Mexican economic plants (Martínez, M. ''Las plantas mas utiles que existen en la República Mexicana'' 1928). Furthermore, it is not one of the many plants considered in Dodge's catalogue (Dodge, C. R. ''A descriptive catalogue of useful fiber plants of the world'' U.S. Dept. Agr. Fiber Invest. Rept. 9(1897)). Neither is it enumerated in ''Vegetable Fibres'' (Kew Bull. Additional Series II (1912) 2-270).

In 1901, Belmar (Belmar, F. ''Breve reseña histórica y geográfica del Estado de Oaxaca'' (1901) 119) mentioned the pita industry under the *Industrias indígenas*, stating that in Villa Alta beautiful hammocks as well as the type of slipper called *cacle* or *huarache* were manufactured from pita and ixtle.

In 1923, C.H. Wright (l.c.) obtained flowers of *Aechmea magdalenae* and published a brief note on the plant identifying it as the source of a Colombian fibre which had long been known simply as ''pita''. At about the same time, *Aechmea magdalenae* was introduced into southeastern Asia for experimentation (Chevalier, A. in Rev. Bot. App. & Agric. Colon. 3 (1923) 652-60).

Although the fibres of most of the Bromeliaceae have not, on the whole, been commercially promising, that of *Aechmea magdalenae* is of superior quality. It has been shown to possess great powers of resistance to the effects of salt water. Cross and Bevan (quoted in Burkill, I.H. ''A dictionary of the economic products of the Malay Peninsula'' 1 (1935) 367-8) report that ''of the fibres of potential industrial importance it stands pre-eminent. The breaking-strain gives a number for weight / length unit superior to those of the staple textile fibres of all classes. The tenacity figures are quite remarkable. The resistance to alkaline hydrolysis (caustic soda) is good''

THE GENUS PAPPERITZIA

BY

LOUIS O. WILLIAMS

IN 1844, H.G. Reichenbach described *Leochilus Leiboldi* from specimens received in liquid from Leibold. He realized that the species was different from Leochilus but at that time did not think that it was distinct enough to warrant the erection of a new genus. However, in 1852, Reichenbach described the genus Papperitzia to include this species. Later, in 1854, in his Xenia Orchidacea, he redescribed it and published a figure. The figure is so badly drawn that it is misleading.

The characters of Papperitzia were so obscure, however, that Bentham included it among his uncertain genera in the Genera Plantarum.

In Reichenbach's herbarium there are two specimens of Papperitzia, the original one which was collected by Leibold and a specimen collected by Kienast. Dr. Rudolph Schlechter had one specimen in his herbarium collected by H. Schenck. In the Ames Herbarium there are two specimens, one collected by Purpus and the other collected by Nagel & Juan G. [onzáles]. The latter specimen is also represented by flowers preserved in liquid.

The study of this more adequate material has made possible a fuller understanding of the genus, and consequently, it seems advisable to present an amplified description.

Papperitzia *Reichenbach filius* in Bot. Zeit. 10 (1852) 670; Xenia Orch. 1 (1858) 237, t. 100, figs. I, 1–5.

Small epiphytic herbs. Stems pseudobulbose. Pseudobulbs small, ancipitous, unifoliate. Leaves coriaceous, lateral under the pseudobulbs (usually one pair) and articulated, and also with a single leaf on the summit of

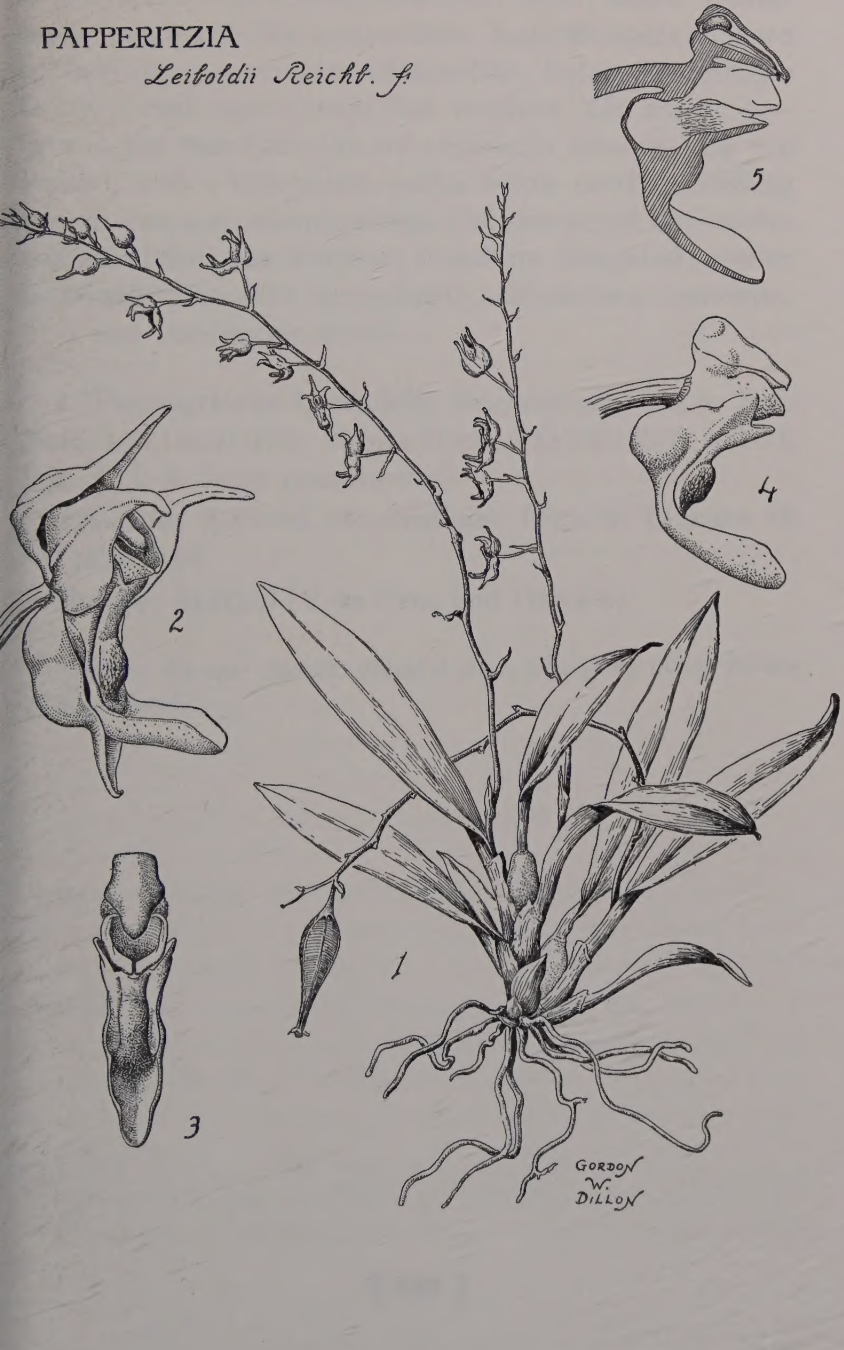
EXPLANATION OF THE ILLUSTRATION

PAPPERITZIA LEIBOLDII *Reichb.f.* 1, plant, natural size. 2, flower, oblique view, enlarged four times. 3, lip and column from the front, enlarged four times. 4, lip and column from the side, enlarged four times. 5, longitudinal section of lip and column to show sac.

Drawn from herbarium specimen and flowers preserved in liquid by GORDON W. DILLON.

PAPPERITZIA

Leiboldii Reichb. f.



the pseudobulb. Peduncles lateral, simple. Inflorescence racemose, few- to several-flowered; bracts small. Dorsal sepal free, hood-like, subcaudate. Lateral sepals connate to their apices, navicular, subcaudate. Petals free, similar to the dorsal sepal except flat, caudate. Lip fleshy, saccate at the base (but the sac ordinarily obscured by the sepals), with a trilobulate callus below partly enfolding the column and column-wings. Column short, auriculate-winged at the apex, footless; rostellum elongated; anther terminal, operculate, incumbent; pollinia two, ceraceous.

A rare monotypic genus.

1. **Papperitzia Leiboldii** *Reichenbach filius* in Bot. Zeit. 10 (1852) 670; Xenia Orch. 1 (1858) 237, t. 100, figs. I, 1–5, (very poor figures).

Leochilus Leiboldi Reichenbach filius in Linnaea 18 (1844) 404.

Range: Mexico (Vera Cruz and Oaxaca).

Mexico: *Kienast; Liebold; Nagel & Juan G[onzáles] 6050; Purpus 2125; Schenck.*

NOMENCLATORIAL NOTES XIII

BY

CHARLES SCHWEINFURTH

Erythrodes santensis *(Kränzl.) C. Schweinfurth comb. nov.*

Physurus santensis Kränzlin in Kungl. Svensk. Vet. Akad. Handl. 46 (1911) 39, t. 7, fig. 6.

Since *Physurus* L.C.Rich., a nomen nudum, is synonymous with *Erythrodes* Bl., the new combination is necessary.

It is evident that the artist's drawing (l.c.) represents the natural forcipate position of the apical arms of the lip, whereas in the forcibly expanded position these arms are reversed and assume a retrorsely lunate position.

A collection from Colombia appears to be referable to this species which was described from São Paulo, Brazil. These plants differ from the typical form in having broader leaves (up to about 20 mm. wide) and in having larger petals.

COLOMBIA: Intendencia El Chocó, in dense forest south of Río Condoto, between Quebrada Guarapo and Mandinga, at 120-180 meters altitude, April 22, 28, 1939, *E.P.Killip 35674.*

Malaxis liparidioides *(Finet) C. Schweinfurth comb. nov.*

Microstylis liparidioides Finet in Bull. Soc. Bot. France 55 (1908) 333, t. 10, figs. 1-10

As the concept *Microstylis* Nutt. ex Lindl. is synonymous with the earlier name *Malaxis* Soland. ex Sw., the new combination is required.

This species, which was described from Ecuador and Peru, is now recorded from Colombia.

COLOMBIA: Dept. El Valle, El Silencio, Yanaconas, at 1900-2200 meters altitude, terrestrial in dense forest, flowers green with white lip, February 28, 1939, *E.P.Killip & Hernando Garcia 33775.*